

Second International Workshop on Laser-Plasma Interaction Physics

FLUCTUATION-INDUCED STIMULATED RAMAN SCATTERING*

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In some experiments¹ with unsmoothed laser beams, SRS appears to be operative down to remarkably low plasma density. This is puzzling², since it is difficult to achieve large gains when the associated plasma wave is so heavily damped. We consider stimulated Raman scattering in the presence of a finite-amplitude ion wave. The wave number of the ion wave is chosen to take up sufficient momentum that the associated electron plasma wave becomes weakly damped. This fluctuation-induced instability has a weaker source term (by $1/2 \delta n/n$) but can have a larger growth rate since the associated electron plasma wave is much less damped. The theory is discussed, and some related work³ in the area of harmonic generation noted.

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¹ D. S. Montgomery, *et al.*, Phys. Plasmas **3**, 1728 (1996).

² A. Simon, Bull. Am. Phys. Soc. **41**, 1445 (1996).

³ J. Parashar and H. D. Pardey, IEEE Trans. Plasma Science **20**, 996 (1992).